

Pine and cherry from the Calvert Miocene

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The presence of land plants in the marine sediments of the Middle Atlantic States Miocene is an infrequent occurrence and is for the most part confined to a very limited number of localities in the near shore deposits of the Calvert formation.

In 1916 twenty-six species of plants were enumerated:¹ 16 from Richmond, Virginia, and 17 from two localities in the District of Columbia, 7 being common to the two regions. This flora included a *Salvinia*, 2 conifers and 23 dicotyledons. Leguminous leaflets and oak leaves predominate among the last and cypress was the most common form at Richmond.

These plants indicated a middle Miocene age, probably to be correlated with the Tortonian stage of Europe. Ecologically the Richmond forms appeared to indicate a low coast lined with cypress swamps and an inconsiderable run-off, and the District of Columbia forms indicated that they grew among coastal dunes.

Despite the fact that the fossiliferous Miocene of tidewater Maryland and Virginia has attracted the attention of geologists for more than 2 centuries and is visited annually by scores of students interested in collecting shells, the bones of marine mammals and other sea life preserved in these Miocene sediments, no traces of land plants have, so far as I know, been recorded from the classic outcrops such as those of the Calvert Cliffs along the western shore of Chesapeake Bay or those along Potomac River until the summer of 1933, when two specimens of a new species of walnut were discovered—one in Zone 11 at a locality $1\frac{1}{2}$ miles south of Plum Point in the Calvert Cliffs, and the second at Richmond, Virginia.²

During the summer of 1935 a fairly well preserved pine cone was collected from Zone 11 at a point 1.7 miles south of Plum Point, and a stone of a *Prunus* was collected from the Nomini

¹ Berry, Edward W. The physical conditions indicated by the Flora of the Calvert formation. U. S. Geol. Survey Prof. Paper 98, pp. 61-73, pls. 11, 12, 1916.

² A Walnut from the Chesapeake Miocene. Jour. Wash. Acad. Sci., vol. 24, pp. 227-229, 1934.

Cliffs on the right bank of the Potomac in Westmoreland County, Virginia. It is the purpose of the present note to describe these two occurrences.

Pinus collinsi n. sp. Figure 2

Although the pine cone is too incompletely preserved to be given a distinctive diagnosis it is probably a new species, since,



Fig. 1. *Prunus calvertensis*, Berry, n.sp.

Fig. 2. *Pinus collinsi*, Berry, n.sp.

with the exception of the seed of a *Pinus* to be mentioned presently, it is the only trace of *Pinus* known from eastern North America in the interval between the Eocene and the Pleistocene. The specimen clearly belongs in the genus *Pinus* and since it seems preferable to give it a specific name it is named for the collector, R. Lee Collins.

The specimen, which is incomplete at the base, is 8 centimeters long and about 3 centimeters in diameter. The scales are thin; somewhat, but not greatly thickened and umbonate distad, unarmed, about a centimeter in width and 2 centimeters or

slightly more in length in the central part of the cone, becoming progressively smaller in the upper part of the cone.

The specimen had evidently been in the water a long time before it sank to the bottom and was buried by sediment, since some of the basal scales had dropped off and the lignite is brittle and structureless. It is impossible to locate the fossil among the different sections of the genus. It could belong to the white pine group among the soft pines, although our modern species in this group have larger cones, or it could be related to some of the pitch pines in which the prickles may be poorly developed or fall when the cones open.

Naturally one does not expect a Miocene species to be especially close to an existing species and I have no useful comparisons to make with recent cones. Nor is there any merit in comparisons with Miocene cones from other and far distant floral provinces. Almost any modern unarmed pine cone of about the same size would have much the appearance of this badly preserved fossil specimen.

It is interesting in this connection to call attention to a single, and not especially well preserved, seed of *Pinus* described from the District of Columbia.³ This could easily belong to the same botanical species as the present cone.

Locality: 1.7 mi. south of Plum Point, Calvert Co., Md.

Horizon: Zone 11 of Calvert formation, about 6 ft. above the base of the zone.

Collector: R. Lee Collins, July, 1935.

Prunus calvertensis n. sp. Figure 1

Stone somewhat compressed, nearly circular in profile, about 1.4 × 1.6 centimeters in length and width, and 8 millimeters in maximum thickness. The lignite is structureless, but after photographing the single specimen it was cut across and the interior is completely filled by what is interpreted as a single seed. The surface of the stone is rugose throughout as shown in the accompanying illustration.

The specimen has been compared with various Cornaceae, Tiliaceae, Elaeocarpaceae, *Celtis*, *Zizyphus*, *Grewia*, *Zanthoxylum*, etc. with unsatisfactory results and appears to belong to

³ Op. cit. p. 66, pl. 12, figure 1.

Prunus. Naturally a single stone (pit) is not much of a basis for a new species, but the likelihood of finding even a second specimen is remote.

The genus is widely distributed in modern floras of the North Temperate Zone with about 125 species and many cultivated varieties. Baillon segregated it in 9 sections and Focke uses seven. Several of these, e.g. *Amygdalus* are undoubtedly entitled to generic rank. The fossil obviously does not belong to the plum, almond or peach tribes but might well be related to the cherries.

No useful comparisons with existing species are possible nor does the fossil appear to be close to any of the existing North American species, but it is impossible to get far with the stones alone, nor do we know the factors making for rugosity, although some authors are inclined to think it has a relation to increased size of the fleshy exocarp, and this is partly borne out by the features in horticultural hybrids.

No leaves of *Prunus* are known from the Miocene of eastern North America. Without checking the identifications it may be said that about 80 fossil species of *Prunus* have been described ranging in time from the Upper Cretaceous through the Pleistocene and reaching a maximum in the Miocene. They are all confined to the Northern Hemisphere, and beginning with the Eocene a considerable number, about half the total known, are represented by fruits. Among these the one which appears most similar to *Prunus calvertensis*, although it is doubtful if this is of any real significance, is a form from the Pliocene of Swalmen, Holland which is referred by the Reids to *Prunus spinosa* Linné.

Locality: Nomini Cliffs (bluff named Horsehead on Coast Survey Chart).

Horizon: Zone not determined.

Collector: Charles T. Berry, June, 1935.

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